ARIZONA DEPARTMENT OF HEALTH SERVICES

BUREAU OF EMERGENCY MEDICAL SERVICES AND TRAUMA SYSTEM

LEVEL I TRAUMA CENTERS

PERFORMANCE MEASURES:

INTER-FACILITY TRANSFERS

ARIZONA STATE TRAUMA REGISTRY 2012

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Report No. 14-2-LI

Purpose:

The purpose of this report is to provide Arizona's Level I Trauma Centers with their individual performance benchmarked against the aggregate.

Performance Measures:

The Arizona State Trauma Registry 2012 (ASTR) queried cases with an "Emergency Department (ED) or Hospital Arrival Date" (D1_04) of January 1, 2012, to December 31, 2012. The following report describes inter-facility transfer patients.

1. Inter-facility transfers
    - ⇒ Demographics
    - ⇒ Incident of injury
    - ⇒ Payer mix
    - ⇒ Injury severity score
    - ⇒ Mode of transport
    - ⇒ Discharge status

2. Discharges from the ED after an inter-facility transfer
    - ⇒ Mode of transport
    - ⇒ ED LOS in hours
    - ⇒ Payer mix

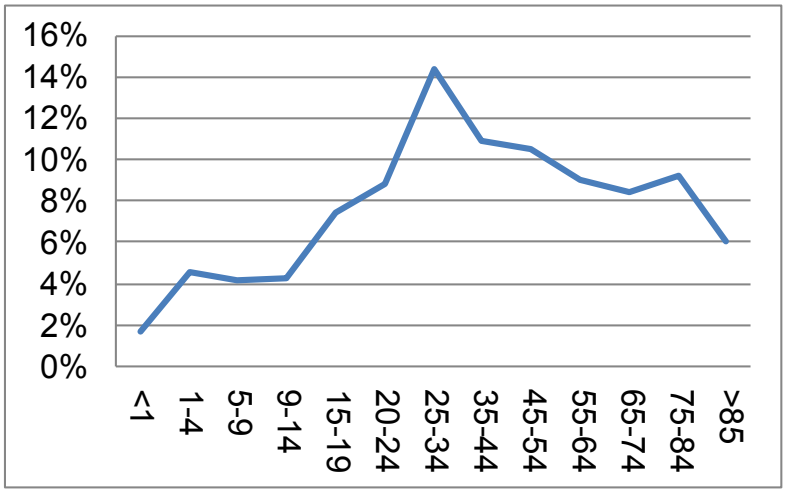
3. ED Length of Stay (LOS) at referring facility
    - ⇒ Total ED LOS in hours at referring facility
    - ⇒ ED LOS at referring facility when ISS>9
    - ⇒ ED LOS at referring facility when ISS>15

For additional information on data elements and definitions please refer to the ASTR data dictionary.

Table 1: Demographics for inter-facility trauma patients

	N	%
Total transfers	5,008	100%
Age		
<1	86	1.7%
1-4	233	4.6%
5-9	211	4.2%
10-14	218	4.3%
15-19	372	7.4%
20-24	445	8.8%
25-34	723	14.4%
35-44	549	10.9%
45-54	529	10.5%
55-64	455	9%
65-74	421	8.4%
75-84	465	9.2%
>85	301	6%
Gender		
Female	1,649	32.9%
Male	3,359	67%
Race/Ethnicity		
Missing/Not	28	0.5%
Hispanic	1,113	22.2%
White	2,650	52.9%
American Indian or Alaska Native	927	18.5%
Black or African American	152	3%
Asian Pacific Islander	26	0.5%
Other	112	2.2%

Graph 1: Age distribution of transfers



In 2012, there were 5,008 inter-facility trauma transfers.

Arizona saw two male transfers between facilities for every one female transfer.

For all inter-facility trauma transfers, older adults (>65 years of age) made up 23.6%, adults (20-64 year of age) made up 53.6%, and children/teens (<19 years of age) made up 22.2%.

Over half of all patients were white (52.9%) followed by Hispanic (22%). Although American Indians/Alaskan Natives represent 5% of the Arizona population, they were involved in 18.5% of all transfers.

Table 2: Incident county of injury for inter-facility trauma patients (n=5,008)

	N	%
Missing	206	4.1%
Apache	264	5.2%
Cochise	206	4.1%
Coconino	123	2.4%
Gila	174	3.4%
Graham	58	1.1%
Greenlee	11	0.2%
La Paz	27	0.5%
Maricopa	2,171	43.3%
Mohave	18	0.3%
Navajo	377	7.5%
Other	128	2.5%
Pima	496	9.9%
Pinal	281	5.6%
Santa Cruz	69	1.3%
Yavapai	237	4.7%
Yuma	162	3.2%

The greatest proportion of incidents that required a transfer occurred in Maricopa County (43%). This was followed by Pima (9.9%), Pinal (5.6%), and Apache (5.2%). All other counties in the state had less than 5% of transfer volume.

Graph 2 shows the county trauma rate as reported by all participants ASTR facilities in 2012. The highest trauma rates are in Coconino county. These are followed by Apache, Gila, and Yuma.

An interactive map for all of the licensed ADHS licensed facilities has been developed and is available to view online.

http://adhsgis.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=69011dc3a5424be1b3c64a2bb4500a90

Map 1: Trauma rate per county in 2012

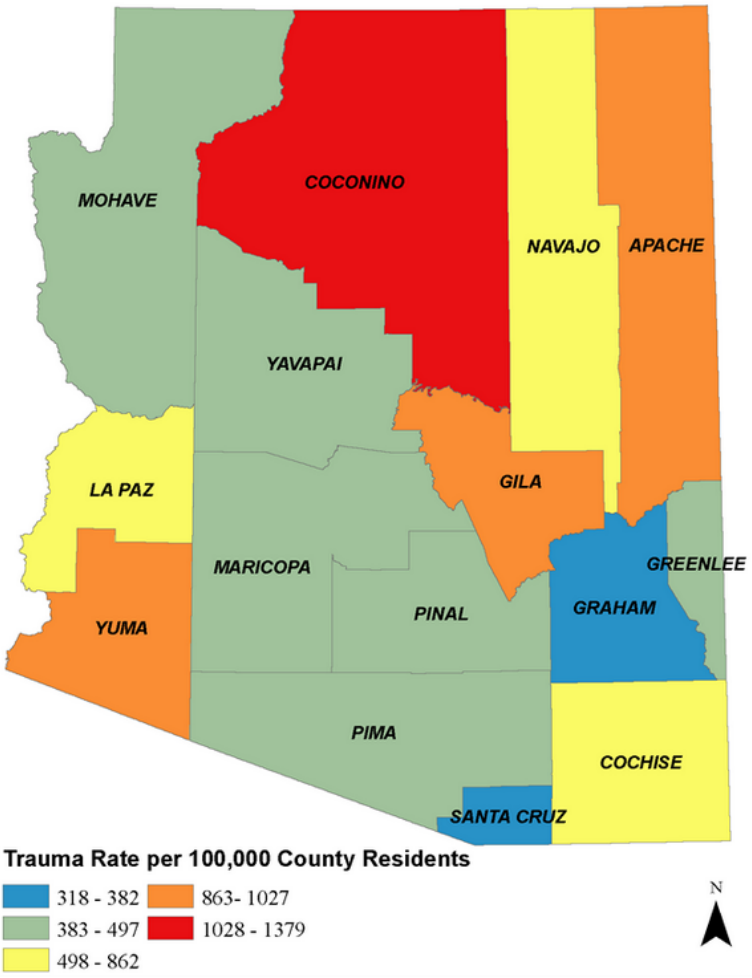
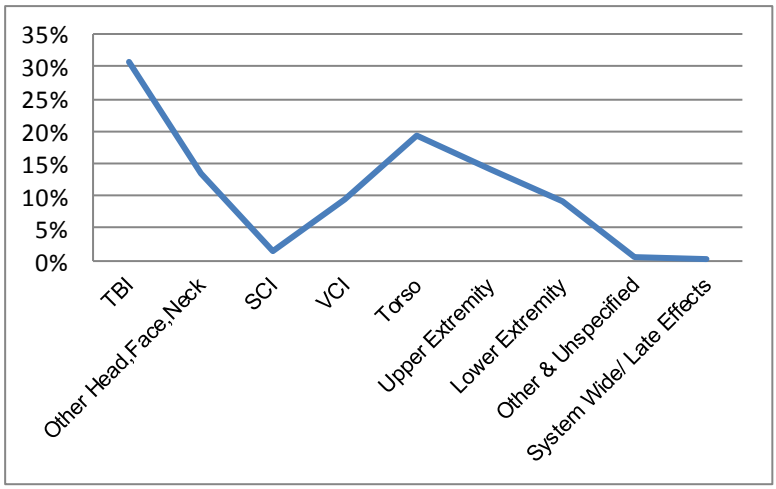


Table 3: Body region injury location for inter-facility trauma patients

	N	%
Missing/NA/ND	70	1.3%
Traumatic Brain Injury (TBI)	1,548	30.9%
Other Head, Face, Neck	681	13.5%
Spinal Column Injury (SCI)	72	1.4%
Vertebral Column Injury (VCI)	468	9.3%
Torso	972	19.4%
Upper Extremity	714	14.2%
Lower Extremity	451	9%
Other & Unspecified	24	0.4%
System Wide & Late Effects	8	0.1%

Graph 2: Body region injury location for inter-facility trauma patients



The most common body injuries affected for transfers were Traumatic Brain Injury (TBI) (31%), torso (19%), upper extremity (14.2%), and other head, face, neck (13.5%).

Graph 2: Transport method for transfers

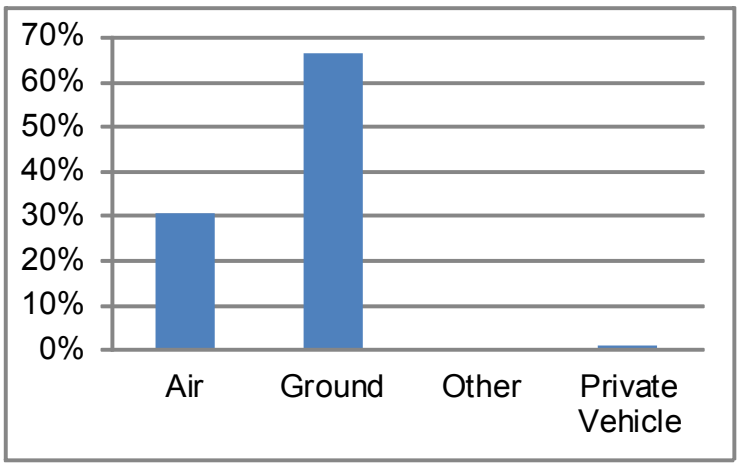


Table 4: Transport method for transfers

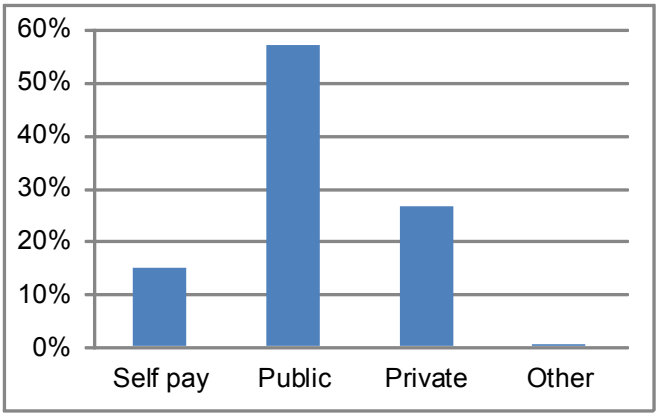
	N	%
Missing	93	1.8%
Air	1,533	30.6%
Ground	3,332	66.5%
Other	1	0.0%
Private Vehicle	49	0.9%

Most patients were transported by ground ambulance (66%) instead air (31%). A small percentage of individuals were transported by a private vehicle (1%). Air ambulance transports should be reserved for the most critically injured patients.

Table 5: Payer mix for transfer patients

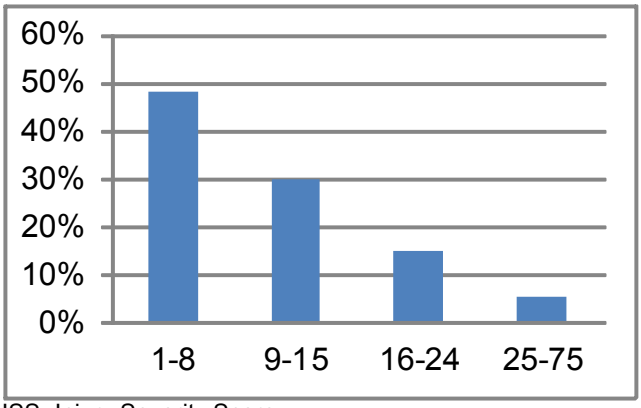
	N	%
Total	5,008	100%
Not Documented	58	1.1%
Self pay	743	14.8%
Public	2,864	57.1%
Private	1,324	26.4%
Other	19	0.3%

Graph 3: Payer mix for transfers patients



In 57% of cases, taxpayers were responsible for the cost of inter-facility transfers. A public insurance consisted of Medicare, AHCSS, or other government insurance. The remaining cases were charged to private insurance (26%) and self pay (15%).

Graph 4: ISS* for transfer patients



ISS=Injury Severity Score

Table 6: ISS* for transfer patients

	N	%
Missing	80	1.5%
1-8	2,411	48.1%
9-15	1,488	29.7%
16-24	749	14.9%
25-75	280	5.5%

Almost half of patients were minor to moderately injured (78%). The patients that were severely injured made up 20% of transfers.

Table 7: Discharge status for transfer patients

	N	%
Admit death	102	2.0%
Discharge home after admission	3,862	77.1%
ED death	6	0.1%
ED discharge home	382	7.6%
Home health	1	0.0%
Left against medical advice	4	0.0%
LTC/SNF/Other rehab	625	12.4%
Transfer/acute care	26	0.5%

ED=Emergency Department, LTC=Long Term Care, SNF=Skilled Nursing Facility

A majority of patients were discharged home (77%). Interestingly, some patients were discharged directly from the Emergency Department (7.6%).

Of all transfers, 2.1% expired as a result of their injuries.

Table 8: Method of transport for patients discharged from the ED (n=382)

	N	%
Missing	1	0.2%
Air	69	18%
Ground	312	81.6%

Table 9: Payment method for patients discharged from the ED (n=382)

	N	%
Self pay	83	21.7%
Public	201	52.6%
Private	93	24.3%
Other	5	1.3%

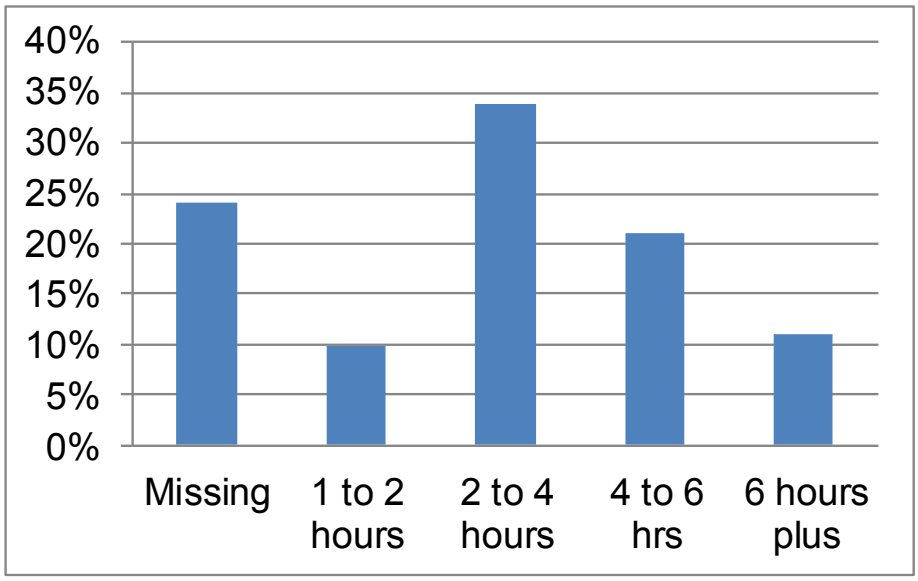
Most patients who were discharged from the ED arrived by ground ambulance (81%) versus air (18%). In over half of patients (53%) the public was charged for payment. When compared to the overall transfers, a higher proportion of patients discharged from an ED following a transfer did not have insurance (22%).

Table 10: Injury location for transfer patients who were discharged from the ED

	N	%
Total	382	100%
Missing	14	3.6%
Traumatic Brain Injury	71	18.5%
Other Head, Face, Neck	114	29.8%
Vertebral Column Injury	40	10.4%
Torso	57	14.9%
Upper Extremity	41	10.7%
Lower Extremity	39	10.2%
Other & Unspecified	5	1.3%
System Wide & Late Effects	1	0.2%

There was a variation in the injuries sustained by patients. The most common injury location was found in Other head, face, neck (30%), Traumatic Brain Injury (18.5%).

Graph 5: ED dwell time for transfer patients (n=5,008)



Nearly a quarter of times transfer times were missing in patients. An ED dwell time was calculated by subtracting the date/time of patient discharge from the date/time of patient arrival at a Level IV Trauma Center.

Table 11: ED dwell time for transfer patients (n=5,008)

	N	%
Total transfers	5,008	100%
Missing	1,206	24%
Less than 2 hours	494	9.8%
2 to 4 hours	1,698	33.9%
4 to 6 hours	1,058	21.1%
6 hours or more	552	11.0%

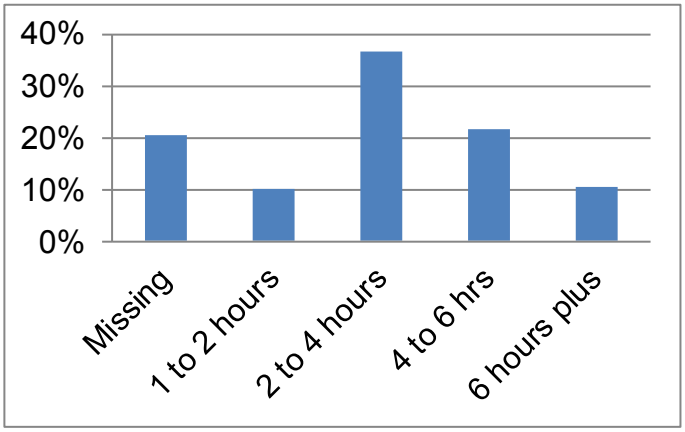
There was a variation in the injuries sustained by patients. The largest injury location was found in Other head, face, neck (30%), Traumatic Brain Injury (18.5%).

Table 10: ED Length of Stay (LOS) for patients with an ISS > 9

	N	%
Total transfers	1,806	100%
Missing	372	20.5%
1 to 2 hours	186	10.2%
2 to 4 hours	664	36.7%
4 to 6 hours	392	21.7%
6 hours plus	192	10.6%

ISS=Injury Severity Score

Graph 5: ED Length of Stay (LOS) for patients with an ISS > 9



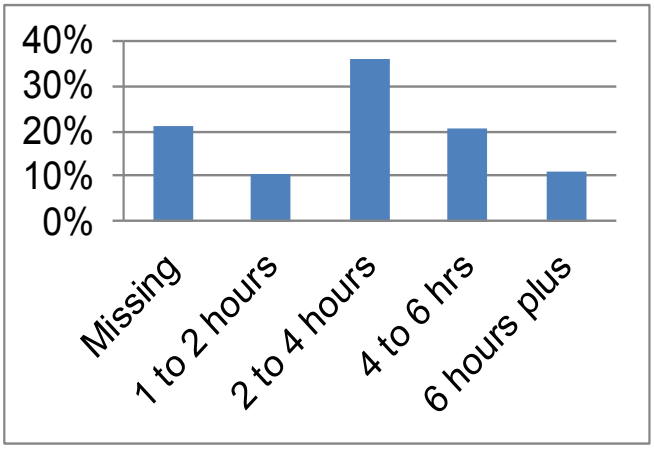
ISS=Injury Severity Score

Patients that have an ISS over 9 are considered to have a moderate to severe injury. Only 10% of moderate/severe trauma patients were assessed and transferred within the ideal time of 1 to 2 hours.

Table 11: ED Length of Stay (LOS) for patients with an ISS > 15

	N	%
Total transfers	1,029	100%
Missing	219	21.2%
1 to 2 hours	108	10.4%
2 to 4 hours	373	36.2%
4 to 6 hours	215	20.8%
6 hours plus	114	11.0%

Graph 6: ED Length of Stay (LOS) for patients with an ISS > 15



In severely injured trauma patients (ISS > 15) ED dwell times mirror those seen in Table 10. Level I Trauma Centers should consider reaching out to Level IV Trauma Centers to identify the appropriate patients at the varying levels of care.